

# The Unexpected Consequences of Automation in Policing

Elizabeth E. Joh<sup>1</sup>

\_\_\_ S.M.U. L. Rev. \_\_\_ (2022)

## I. Introduction

Automated decisions are a big part of police work today. The conventional model underlying automation works something like this. If a machine provides an insight about crime, the police apply that knowledge in their decision about where to go and what to do. But if the police did just that, it would be surprising. Human beings aren't generally known for their perfect compliance and obedience, and police officers are no exception. Deviating from expectations about how humans use machines can provide creative solutions. Or it can create new problems. What happens when the police use automation in unexpected ways?

Raising this question and putting its importance in context matters. American policing today is being shaped by two very different forces. One, arising from the national protests surrounding George Floyd's murder in 2020, raises longstanding issues of racial discrimination, unaccountability, and inequality in policing with renewed urgency. Darnella Frazier's decision to record Floyd's death and post the video to Facebook made real the disproportionate share of state violence shouldered by Black Americans.<sup>2</sup> A 2021 study published in the medical journal *The Lancet* described this burden in stark terms. Researchers estimated more than 30,000 Americans died as a result of police violence

---

<sup>1</sup> Professor of Law, U.C. Davis School of Law.

<sup>2</sup> Joshua Neveit, *George Floyd: The personal cost of filming police brutality*, BBC NEWS, June 11, 2020, at <https://www.bbc.com/news/world-us-canada-52942519>.

between 1980 and 2018.<sup>3</sup> Black Americans were three and half times more likely to be killed by the police than whites during that time period.<sup>4</sup>

The other important development is the transformation of policing by the increasing use of technologies that collect and analyze massive amounts of information. Technologies like predictive policing software, risk assessment tools, and facial recognition are part of the family of tools reshaping the structures of institutions throughout society. We can see different labels for these developments including: algorithms, artificial intelligence (AI), big data, and automation. All focus on three developments: the ability to collect and store massive amounts of data easily and cheaply, increases in computing power, and the development of software that analyzes and processes that data with varying degrees of sophistication.<sup>5</sup>

The term automation is broad enough to include all these developments. Here, automation refers to delegating aspects of decisionmaking previously assumed only by people.<sup>6</sup> Some outcomes of automation bring clear benefits, such as voice transcription to help the disabled, or recommendation algorithms that enhance people's enjoyment of books, music, and films. But other changes have life-altering impacts, such as whether a

---

<sup>3</sup> GBS 2019 Police Violence US Subnational Collaborators, *Fatal police violence by race and state in the USA, 1980-2019: a network meta-regression*, THE LANCET, Oct, 2, 2021, at [https://doi.org/10.1016/S0140-6736\(21\)01609-3](https://doi.org/10.1016/S0140-6736(21)01609-3).

<sup>4</sup> *Id.* at 1247 (finding that the “police have disproportionately killed Black people at a rate of 3.5 times higher than White people, and have killed Hispanic and Indigenous people disproportionately as well”); see also Frank Edwards, Risk of being killed by police use of force in the United States by age, race-ethnicity, and sex, 16 Proceedings of the National Academy of Sciences of the United States of America 16793, 16793 (2019)(finding that risk of fatal police violence highest for black men, who face a one in one thousand chance of being killed by the police “over the life course”).

<sup>5</sup> THE NETGAIN PARTNERSHIP, AUTOMATION & THE QUANTIFIED SOCIETY 15 (2018), at <https://www.netgainpartnership.org/resources/2018/1/26/automation-and-the-quantified-society>.

<sup>6</sup> Certainly some discussions require disentangling machine learning from more straightforward algorithms applied to historical data. See, e.g., David Lehr & Paul Ohm, *Playing with the Data: What Legal Scholars Should Learn About Machine Learning*, 51 U.C. DAVIS L. REV. 653, 660-662 (2017)(arguing that Fourth Amendment scholarship on big data and machine learning erroneously treats machine learning as a “fully formed black box” and neglects the “intricate processes of machine learning”). Because this essay focuses on the social and legal implications of unexpected human uses of automated processes, however, the broad use of automation is sufficient here.

person is deemed hireable or creditworthy. These include the growing police reliance on automation.<sup>7</sup>

This essay has two aims. First, it explains how automated decisionmaking can produce unexpected results. This is a problem long understood in the field of industrial organization. To identify such effects in policing is no easy task. The police are a notoriously difficult institution to study. They are insular, dislike outsiders, and especially dislike critical outsiders. Fortunately, we have the benefit of a decade's worth of experimentation in the police use of automated decisionmaking, and the resulting political backlash against some of these uses. As a result, some large urban police departments have undergone external investigations to see whether tools like predictive policing or individual criminal risk assessments are biased or ineffective or simply too costly in light of their benefits. One of these recent reports, on the use of acoustic gunshot detection software in Chicago, provides a window into one type of police automation.

This leads to the article's second observation. Automation is not just a set of tools that the police use; it changes the environment of policing in unexpected ways. There are now some widely-known criticisms of the increasing use of automated tools in policing, but they focus primarily on the flaws of the technologies used. The training data in facial recognition algorithms may be biased along lines of race, gender, and ethnicity.<sup>8</sup> Risk assessments for gun violence may in truth be poor guides for police intervention.<sup>9</sup> These claims are singularly technology-focused. Accordingly, errors and inefficiencies merit *technological* improvements. Even calls for bans on technologies like facial recognition are responses to the technology itself. As Chicago's experience with acoustic gunshot detection technology demonstrates, however, automation serves not just as a tool for the police, but also led to changes in police behavior. These changes in police conduct are

---

<sup>7</sup> See, e.g., Sarah Brayne, *The Criminal Law and Law Enforcement Implications of Big Data*, 14 ANN. REV. L. & SOC. SCI. 293, 294 (2018) ("Law enforcement agencies are starting to use big data in a range of daily operations and surveillance activities, including patrol, investigation, and crime analysis.").

<sup>8</sup> See, e.g. Steve Lohr, *Facial Recognition Is Accurate, if You're a White Guy*, N.Y. TIMES, Feb. 9, 2018, at <https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html> (discussing analysis by Joy Buolamwini that found three leading face recognition systems had high rates of error—as much as 35 percent—for non-white women compared to white men).

<sup>9</sup> See generally, CITY OF CHICAGO OFFICE OF INSPECTOR GENERAL, ADVISORY CONCERNING THE CHICAGO POLICE DEPARTMENT'S PREDICTIVE RISK MODELS (2020).

documented in a 2021 report from the Chicago Office of Inspector General.<sup>10</sup> And they are noteworthy. If automation unexpectedly changes police behaviors, these changes have implications for how we understand policing through the lens of inequality and unaccountability.

## II. Automation's Effects

The increasing use of technologies to capture, store, and analyze every movement, click, post, and transaction has become a conventional part of ordinary policing. Whether labelled as artificial intelligence or big data, these new technologies of surveillance and investigation give the police capabilities unimaginable a generation ago. Predictive policing software identifies persons and places associated with a high risk of criminality. License plate reader systems capture and store millions of plate scans that allow individualized tracking of people. Private and public sources feed millions of faces everyday into databases that are scanned by law enforcement agencies. Both mass aerial surveillance planes and autonomous drones can capture images useful for investigations. The scope of these technologies is enormous and includes details like our faces and driving patterns. One report estimates that as of 2016, one in two American adults has a picture stored in a facial recognition network.<sup>11</sup> One of the largest vendors of license plate reader data boasts that its database, accessible to law enforcement, has more than nine billion license plate scans: more than 30 for every registered vehicle driven today.<sup>12</sup>

Although these technologies represent enormous leaps of scale and capability, they also have continuities with past practices. Surveillance is an essential aspect of modern society.<sup>13</sup> And policing in particular has always needed methods of collecting, sorting, and

---

<sup>10</sup> See Part III, *infra*.

<sup>11</sup> GEORGETOWN LAW CENTER ON PRIVACY & TECHNOLOGY, THE PERPETUAL LINE-UP, UNREGULATED POLICE FACE RECOGNITION IN AMERICA (2016), at <https://www.perpetuallineup.org/>. By facial recognition network, the Center on Privacy and Technology refers to the fact that more than half of states allow the police to run searches against driver's license and ID photo databases. *Id.* at 2.

<sup>12</sup> Byron Tau, *License-Plate Scans Aid Crime-Solving but Spur Little Privacy Debate*, W.S.J., Mar. 10, 2021, at <https://www.wsj.com/articles/license-plate-scans-aid-crime-solving-but-spur-little-privacy-debate-11615384816>.

<sup>13</sup> See, e.g. ANTHONY GIDDENS, THE CONSEQUENCES OF MODERNITY 57-58 (1990) (“[The] administrative concentration [necessary for a capitalist society] depends in turn upon the development of *surveillance* capacities well beyond those characteristic of traditional civilisations, and the apparatuses of surveillance

deriving insights from information. What is distinctive about today's automation, however, is its ease, breadth, and depth. Whether collected directly or indirectly by the police, data can be captured easily, kept indefinitely, and assessed repeatedly. Not only do these new tools permit the police to collect and assess data about individuals and populations, they do so with low effort.<sup>14</sup> Neither license plate readers or facial recognition software needs human intervention. Their automated matches are routinized and automatic.<sup>15</sup>

Earlier studies on automation can provide a great deal of insight here. We know that the introduction of automated systems into any field can bring with it unanticipated problems and failures.<sup>16</sup> An observation from industrial organization is that technology cannot be understood in isolation from the people tasked with using it.<sup>17</sup> This is true of pilots and cockpit computers as well as factory machine operators. When automated processes arrive in the workplace, a common misunderstanding is that these tools will increase speed and efficiency, but will otherwise leave other systems and actors unaffected.<sup>18</sup> But this "substitution myth" is not borne out in reality.<sup>19</sup> Automation brings with it transformative changes.

Sometimes unintended consequences occur in automation because there is a gap between how the developers envision the use of their systems and how they work in real life.<sup>20</sup> Automating processes can lead to changes that are "qualitative and context-dependent"

---

constitute a third institutional dimension associated, like capitalism and industrialism, with the rise of modernity."); DAVID LYONS, *THE ELECTRONIC EYE: THE RISE OF THE SURVEILLANCE SOCIETY* 33 (1994) ("The rise of the 'surveillance society,' then, is inextricably bound up with the growth of the modern nation-state.").

<sup>14</sup> Gary Marx, *What's new About the 'New Surveillance'? Classifying for Change and Continuity*, 1 *SURVEILLANCE & SOC'Y* 9, 11 (2002) (noting that much modern surveillance is remote and of low effort).

<sup>15</sup> Sarah Brayne, *Big Data Surveillance: The Case of Policing*, *AM. SOC. REV.* 1, 3 (2017) ("Whereas traditional surveillance is inductive, involving the 'close observation, especially of a suspected person, and relying on the unaided senses, new surveillance is more likely to be applied categorically, deductive, remote, low visibility or invisible, involuntary, automated, preemptive, and embedded into routine activity.").

<sup>16</sup> N. B. Sarter et al., *Automation Surprises* 1, in *HANDBOOK OF HUMAN FACTORS & ERGONOMICS* (2d. Ed G. Salvendy, ed., 1997).

<sup>17</sup> David D. Woods & Nadine B. Sarter, *Learning from Automation Surprises and 'Going Sour' Accidents*, in *COGNITIVE ENGINEERING IN THE AVIATION DOMAIN* 9 (N. Sarter & R. Amalberti, eds.).

<sup>18</sup> Sarter, *supra* note xx, at 1 ("The assumption was that new automation can be substituted for human action without any larger impact on the system in which that action or task occurs, except on output.").

<sup>19</sup> *Id.*

<sup>20</sup> *Id.* At 2.

in the workplace.<sup>21</sup> Early studies of auto-pilot programs revealed some surprises. Developers designed these systems to improve safety by having machines assume some of a pilot's tasks. But their designs did not always take into account how pilots would interact with their machines. Pilots might not understand some of the new processes, and ignore some processes as a result. New machines introduced complexity by requiring tasks that pilots hadn't performed before. Automated flight deck systems may not work as intended if they do not take into account actual air traffic control patterns and the varying preferences of pilots.<sup>22</sup> Automation in flight did not just substitute for the work of a human being; it changed flying a plane and the pilots themselves in unexpected ways.

Also relevant here is the repeated observation that all of us rely heavily on mental shortcuts. We lean on strategies to simplify our decisionmaking, rather than engage in full and thorough assessments. Without these simplifications, even ordinary decisionmaking would be exhausting. In the terms of social psychology, we are "cognitive misers."<sup>23</sup> When confronted with complex problems, people tend to adopt cognitive shortcuts that emphasize efficiency, even if these solutions are incorrect, biased, or less than optimal.<sup>24</sup> The result is that our decisionmaking processes favor simplicity over comprehensiveness, and speed over reflection. Legal scholars have used the cognitive miser framework to help explain recurring but troubling instances of decisionmaking, including how racial bias can influence decisions about force and suspicion.<sup>25</sup>

In short, policing itself is being transformed by processes that have not just expanded the surveillance capabilities of the police, but have automated many processes once considered essentially human, like judgments about suspicion and recognition of persons. We also know that automation does not simply lighten work burdens by substituting machines for human labor. Automation can produce surprising, and sometimes unwanted effects. This means that people may face new and unexpected complexities

---

<sup>21</sup> *Id.*

<sup>22</sup> *See id.*

<sup>23</sup> SUSAN T. FISKE & SHELLEY E. TAYLOR, SOCIAL COGNITION 13 (2d ed. 1991). The social psychologists Susan Fiske and Shelley Taylor are credited with coining the term "cognitive miser," which had broad applications to a variety of fields.

<sup>24</sup> *See id.*

<sup>25</sup> *See, e.g.,* L. Song Richardson & Phillip Atiba Goff, *Self-Defense and the Suspicion Heuristic*, 98 IOWA L. REV 293, 298-314 (describing how misleading mental shortcuts can produce "suspicion heuristics": intuitive judgments about criminality or threats that also lead to racially biased perceptions).

when automation enters their workplace. When confronted with complex systems of automation, we might then expect people to take mental shortcuts to make quick decisions in the ways they always have. The results may be surprising, novel, and more complicated in ways that have not anticipated.

### III. Automation's Effects on Policing: ShotSpotter

Police behavior is notoriously difficult to study. As an occupational group police are insular and distrustful of outsiders, especially those who might subject them to criticism or rebuke.<sup>26</sup> Thus whether and how automation works in policing is likely to be a difficult topic to study. With police automation, some transparency has been achieved through oversight mechanisms. A handful of large, urban police departments have undergone reviews by local inspectors general. This section reviews the findings of Chicago's experience with acoustic gunshot technology, as evaluated by the Chicago Inspector General in 2020.

#### A. Chicago, Police, and ShotSpotter

Violent crime and racially disparate policing have been a persistent problem in Chicago for more than fifty years, although its realities are somewhat different than national headlines might suggest.<sup>27</sup> Chicago does not lead the nation in murder, as some have

---

<sup>26</sup> See, e.g., Jack R. Greene, ed., *THE ENCYCLOPEDIA OF POLICE SCIENCE* (3rd. ed. 2007) ("As an outsider group, the patrol officers' occupational identity and subculture crystallize, wherein isolationism, secrecy, strong in-group loyalties, sacred symbols, common language, and a profound estrangement from the larger society intensify."); cf. Richard V. Ericson, *Patrolling the Facts: Secrecy and Publicity in Police Work*, 40 *BR. J. SOCIOLOGY* 205, 211 (1989) ("The police have a particular bent toward reticence and secrecy.").

<sup>27</sup> President Trump famously--and erroneously--described Chicago's violence problem as "worse than Afghanistan." Lyn Sweet, *At police event, Trump calls lefty Chicago 'worse than Afghanistan,' says—again—we're not going to let it go on,* CHICAGO SUN-TIMES, July 13, 2020, at <https://chicago.suntimes.com/columnists/2020/7/13/21323563/police-event-trump-calls-lefty-chicago-worse-than-afghanistan-threatens-not-going-let-it-go-on>.

suggested.<sup>28</sup> But while crime rates fell in Chicago as they have in other major American cities from the 1990s to the 2010s, violent crime remains a problem.<sup>29</sup>

That crime isn't evenly distributed. Instead, crime visits neighborhoods of "concentrated violence" in Chicago, places where violence is matched by entrenched poverty, joblessness, and racial segregation.<sup>30</sup> Low-income, majority Black neighborhoods experience disproportionately higher rates of homicide in Chicago than their wealthier and whiter counterparts.<sup>31</sup> As sociologist Patrick Sharkey has observed of Chicago, the "overall level of violence has fluctuated, but the distribution of violence has been remarkably consistent."<sup>32</sup>

The police in Chicago have turned to many approaches. In 1999, the U.S. Supreme Court struck down the city's Gang Congregation Ordinance. In response to its rising rates of murder and violent crime, the city council adopted in 1992 an ordinance that permitted the arrest of those people who failed to obey a police officer's order to disperse after having been identified as a "criminal street gang member" in a public place "without no apparent purpose."<sup>33</sup> The Court acknowledged that the ordinance was designed to address illegal drug sales and intimidation of city residents by gang members, it nevertheless "afforde[d] too much discretion to the police and too little notice to citizens who wish to use the public streets."<sup>34</sup> Though the initial ordinance was deemed unconstitutionally vague, the city council passed a new ordinance in 2000 that addressed the Court's concerns.<sup>35</sup>

---

<sup>28</sup> John Gramlich & Drew Desilver, *Despite recent violence, Chicago is far from the U.S. 'murder capital,'* PEW RESEARCH, Nov. 13, 2018, at <https://www.pewresearch.org/fact-tank/2018/11/13/despite-recent-violence-chicago-far-from-u-s-murder-capital> (noting that Chicago is "by no means the nation's 'murder capital. For decades, in fact, it has had fewer murders per capita than many other U.S. cities with smaller populations, according to FBI data going back to 1985").

<sup>29</sup> Patrick Sharkey & Alisabeth Marsteller, *Neighborhood Inequality and Violence in Chicago, 1965-2020*, 89 U. CHI. L. REV. 349, 350 (2022).

<sup>30</sup> *Id.* at 349 ("Violence is not evenly distributed across the communities of a city but rather is concentrated in neighborhoods that experience multiple forms of disadvantage, from poverty to segregation to joblessness.").

<sup>31</sup> Robert J. Sampson & Brian L. Levy, *The Enduring Neighborhood Effect, Everyday Urban Mobility, and Violence in Chicago*, 89 U. CHI. L. REV. 324, 326 (2022).

<sup>32</sup> Sharkey, *supra* note xx, at 361. Sharkey finds that of increasing violent crime rates since the 2010s, the "overall increase in murders between 2014 and 2020 has disproportionately affected Black residents." *Id.* at 370.

<sup>33</sup> *Chicago v. Morales*, 527 U.S. 41, 47 (1999).

<sup>34</sup> 527 U.S. at 64.

<sup>35</sup> Dirk Johnson, *Chicago Council Tries Anew with Anti-Gang Ordinance*, N.Y. TIMES, Feb. 22, 2000, at <https://www.nytimes.com/2000/02/22/us/chicago-council-tries-anew-with-anti-gang-ordinance.html>.



Fast forward a few decades, and we can see that the tools used by the Chicago police, like the police everywhere, are considerably different. In 2018, the city of Chicago entered into a three year, thirty-three million dollar contract for services with an acoustic gunshot detection technology company called ShotSpotter.<sup>36</sup> Like many technological tools used by today by the police, the relationship between the Chicago Police and ShotSpotter is a customer-vendor one.<sup>37</sup> In theory, acoustic gunshot technology is designed to help police identify more gunshot incidents and respond to them more quickly.<sup>38</sup> Research suggests that gun violence is severely underreported.<sup>39</sup> In theory, acoustic gunshot detection technology would identify many more incidents for police response that would otherwise go unreported.

ShotSpotter describes its technology as having “automated the process” of identifying gunshots.<sup>40</sup> Its service uses both mounted hardware in public spaces and artificial intelligence at its corporate offices. The company’s acoustic sensors, placed throughout a city, listen for gunshots. Any potential gunshot sound is transmitted from the sensors to ShotSpotter, where machine learning algorithms classify the sound.<sup>41</sup> ShotSpotter’s own human analysts are then supposed to either reject or confirm the identified sounds as

---

<sup>36</sup> CITY OF CHICAGO OFFICE OF INSPECTOR GENERAL, THE CHICAGO POLICE DEPARTMENT’S USE OF SHOTSPOTTER TECHNOLOGY (Aug. 24, 2021), at <https://igchicago.org/wp-content/uploads/2021/08/Chicago-Police-Departments-Use-of-ShotSpotter-Technology.pdf> [hereinafter “OIG Report”]. That contract makes the city of Chicago the company’s largest customer. See Garance Burke, et al., *How AI-powered tech landed man in jail with scant evidence*, Associated Press, Mar. 5, 2022, at <https://apnews.com/article/artificial-intelligence-algorithm-technology-police-crime-7e3345485aa668c97606d4b54f9b6220> [hereinafter “AP Report”].

<sup>37</sup> WGN9. *OIG report, ShotSpotter rarely leads to evidence of gun-related crime, changes police behavior*, Aug. 24, 2021, at <https://wgntv.com/news/chicago-news/oig-report-shotspotter-rarely-leads-to-evidence-of-gun-related-crime-changes-police-behavior/> (“We work very closely with our agency customers to ensure they get maximum value out of our service.”).

<sup>38</sup> ShotSpotter, What is ShotSpotter?, at <https://www.shotspotter.com/law-enforcement/gunshot-detection/#what-is-shotspotter>.

<sup>39</sup> Jillian B. Carr & Jennifer Doleac (Brookings Research Paper), *The geography, incidence, and underreporting of gun violence: new evidence using ShotSpotter data 2* (2016), at <https://www.brookings.edu/research/the-geography-incidence-and-underreporting-of-gun-violence-new-evidence-using-shotspotter-data/> (“Using data from Washington, DC and Oakland, CA, we find evidence of severe underreporting of gun violence.”).

<sup>40</sup> Shot Spotter, *How ShotSpotter Gunshot Detection Works* (updated Aug 2021), YouTube, Aug. 24, 2021, at <https://www.youtube.com/watch?v=Nk98otdlzFI>.

<sup>41</sup> ShotSpotter, *How Does Shotspotter work?*, at <https://www.shotspotter.com/law-enforcement/gunshot-detection/#how-does-shotspotter-work>.

gunshots and not, for instance, fireworks.<sup>42</sup> An alert confirming that a probable gunshot has been detected is then sent to the client police department, in a minute or less.

More than a hundred cities in the U.S. have entered into contracts with the publicly-traded company for these services.<sup>43</sup> The subscription fees charged to cities by ShotSpotter for its services range between \$65,000 to \$95,000 per square mile per year.<sup>44</sup> These commercial relationships typify the growing police reliance on private sector tools that local governments neither use nor completely control.<sup>45</sup> ShotSpotter contracts often state that the firm, not the municipal customer, owns the data.<sup>46</sup> The company also claims that the data it generates from its acoustic gunshot sensors are proprietary trade secrets.<sup>47</sup> This corporate secrecy has made it difficult access the data supporting claims by the company.<sup>48</sup>

In Chicago, gunshots detected by ShotSpotter display as alerts on the ShotSpotter application, available to employees of the Office of Emergency Management and Communications (OEMC), analysts at the police department's Strategic Decision Support Centers, and on-duty officers who have the ShotSpotter mobile app on their work-issued smartphones.<sup>49</sup> Chicago Police Directives instruct officers responding to ShotSpotter alerts to look for victims, evidence of crime, or any potential suspects at the scene.<sup>50</sup>

---

<sup>42</sup> See *id.*

<sup>43</sup> ShotSpotter, ShotSpotter Cities, at <https://www.shotspotter.com/cities/>.

<sup>44</sup> See ShotSpotter, ShotSpotter Fact Sheet, at [https://www.shotspotter.com/system/content-uploads/ShotSpotter\\_Fact\\_Sheet\\_-\\_final\\_draft\\_12.13.pdf](https://www.shotspotter.com/system/content-uploads/ShotSpotter_Fact_Sheet_-_final_draft_12.13.pdf)

<sup>45</sup> In its early days, cities had purchased the equipment and monitored it themselves, but ShotSpotter today is a subscription service officers to municipalities. See Erica Good, *Shots Fired, Pinpointed and Argued Over*, N.Y. TIMES, May 28, 2012, at <https://www.nytimes.com/2012/05/29/us/shots-heard-pinpointed-and-argued-over.html>.

<sup>46</sup> Jennifer L. Doleac, *To reduce gun violence, empower citizens to make their communities safer*, Brookings, Feb. 4, 2016, at <https://www.brookings.edu/opinions/to-reduce-gun-violence-empower-citizens-to-make-their-communities-safer/>.

<sup>47</sup> See *id.*

<sup>48</sup> See Hannah Bloch-Webha, *Access to Algorithms*, 88 FORDHAM L. REV. 1265, 1284 (2020) (“ShotsSpotter and some municipalities—took the position that, pursuant to contract the data was not a matter of public record.”); see also Rebecca Wexler, *Life, Liberty and Trade Secrets: Intellectual Property in the Criminal Justice System*, 70 STANFORD L. REV. 1343 (2018)(discussing a California case in which the court “endorsed ShotSpotter’s legal theory of the trade secret privilege in criminal proceedings”); see also Elizabeth E. Joh & Thomas Joo, *The Harms of Police Surveillance Technology Monopolies*, \_\_\_ DENVER L. REV. F. \_\_\_ (2022, forthcoming)(noting that the “privately developed and controlled nature of these products and services has proven to be a challenge to police oversight and regulation”).

<sup>49</sup> OIG Report, *supra* note xx, at 7.

<sup>50</sup> *Id.* at

Every single ShotSpotter alert becomes a data point. Chicago OEMC employees assign a unique number for each ShotSpotter alert and then dispatches officers to respond.<sup>51</sup> After officers have finished their response to the alert, the primary police unit is required to report the outcome to the OEMC.<sup>52</sup> The disposition code assigned to the outcome of the case depends on whether the event is considered a criminal incident or a non-criminal one.<sup>53</sup> Chicago Police Directives also require that officers who conduct investigatory stops of people because of a ShotSpotter alert record that unique event number as part of the information they record for the stop itself.<sup>54</sup> All of this coding means that ShotSpotter alerts themselves become recorded data that can itself be aggregated and analyzed, as well as cross-referenced with other records like police stops and arrests that may be related.<sup>55</sup>

In 2021, the Public Safety section of the Chicago Office of Inspector General (OIG) began an inquiry into the Chicago Police Department's use of ShotSpotter technology.<sup>56</sup> Its investigation focused on all ShotSpotter alert notifications that occurred between January 1, 2020, and May 31, 2021, as well as all investigatory stops that were associated with a ShotSpotter alert within the police department's cross referencing system.<sup>57</sup> The OIG's final report, issued in August 2021, provided both a quantitative and qualitative analysis of the department's ShotSpotter use.<sup>58</sup>

The sheer number of alerts generated by ShotSpotter is noteworthy. During the seventeen month period under review, the OIG identified a total of 50,176 ShotSpotter alerts as "probable gunshots" with unique identifier numbers.<sup>59</sup> Every single one of these alerts resulted in a police response to the location identified by the company's alerts. The OIG also found 1,056 police investigative stops of persons associated with ShotSpotter alerts,

---

<sup>51</sup> *Id.* At 8.

<sup>52</sup> *Id.* at 9.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.* at 11.

<sup>55</sup> *Id.*

<sup>56</sup> *Id.* at 2.

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.* at 3.

as illustrated in Figure one.<sup>60</sup> In other words, the required documentation associated with these stops shared event numbers with particular ShotSpotter alerts.<sup>61</sup>

Also notable is the geographic distribution of alerts. Nearly a quarter of all alerts—11,903 unique events--were concentrated in two Chicago Police Department districts: the 4th and 5th.<sup>62</sup> These areas, located in the south and southeastern portions of the city, are also coincide with neighborhoods that are both low income and majority African-American or Hispanic.<sup>63</sup> Other analyses have suggested that ShotSpotter sensors tend to be concentrated in urban communities of color, as opposed to evenly distributed throughout a city.<sup>64</sup>

ISR #004941914

EVENT#14451. BWC RECORDED INCIDENT. IN SUMMARY, A/O'S WERE RESPONDING TO A SHOT SPOTTER OF ONE ROUND ON THE SIDE OF THE BUILDING OF [address] A/O'S<sup>49</sup> OBSERVED [subject] (OFFENDER) WALK OUT FROM THE SIDE OF THE BUILDING AT [address]. A/O'S CONDUCTED AN INVESTIGATORY STOP OF THE OFFENDER AT ABOVE LOCATION. A/O OBSERVED A LARGE BULGE IN THE OFFENDER'S BACK POCKET AND FRONT POCKET. A/O'S THEN PERFORMED A PROTECTIVE PAT DOWN OF SUBJECT AND FOUND AN OPEN 24OZ CAN OF ``STEEL RESERVE`` ALCOHOL IN THE OFFENDER'S BACK POCKET (INV#[number]). A/O FOUND A SMALL GLASS BOTTLE THAT APPEARED TO HAVE BEEN FASHIONED INTO DRUG PARAPHERNALIA (INV#[number]) IN OFFENDERS FRONT POCKET. OFFENDER RELATED HE USES THIS OBJECT AS A PIPE TO SMOKE CRACK-COCAINE. A/O'S PLACED OFFENDER INTO CUSTODY AND PERFORMED A NARCOTICS SEARCH OF THE OFFENDER. A/O RECOVERED A SMALL FOLDED PIECE OF WHITE PAPER CONTAINING WHITE POWDER ROCK-LIKE SUBSTANCE SUSPECT CRACK COCAINE (INV#[number]). OFFENDER RELATED TO A/O'S THAT THE SUBSTANCE WAS A SMALL AMOUNT OF CRACK-COCAINE. OFFENDER TRANSPORTED TO 004TH DISTRICT BY [unit] FOR PROCESSING.

---

<sup>60</sup> *Id.* at 3.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 13. The current boundaries of the 4th and 5th police districts can be found at City of Chicago, Boundaries-Police Districts (current), at <https://data.cityofchicago.org/Public-Safety/Boundaries-Police-Districts-current-/fthy-xz3r>.

<sup>63</sup> The MacArthur study used census data to determine the percentage of residents in each Chicago police district who identify as Hispanic or African American. See MacArthur study, *supra* note xx, at 13.

<sup>64</sup> Todd Feathers, *Gunshot-Detecting Tech is Summoning Armed Police to Black Neighborhoods*, VICE, July 19, 2021, at <https://www.vice.com/en/article/88nd3z/gunshot-detecting-tech-is-summoning-armed-police-to-black-neighborhoods> (finding that in Chicago, Kansas City, Cleveland, and Atlanta, “the data shows that the sensors are also placed almost exclusively in majority Black and brown neighborhoods, based on population data from the U.S. Census”).

### Figure 1: Narcotics Arrest Following Response to ShotSpotter Alert<sup>65</sup>

Based on its review, the Chicago OIG's assessment of the police department's use of acoustic gunshot detection technology is withering. Out of the total number of alerts, Chicago police officers reported just 4,556 instances of finding evidence of gun related criminal offenses because of a ShotSpotter alert: representing just 9.1% of all police responses to alerts during the review period.<sup>66</sup> In addition, just 1,056 stops investigatory stops were associated with unique ShotSpotter event numbers.<sup>67</sup> This represented just 2.1% of all police responses to ShotSpotter alerts.<sup>68</sup> Upon its review, the OIG summarized its finding as follows: "CPD responses to ShotSpotter alerts rarely produce documented evidence of a gun-related crime, investigatory stop, or recovery of a firearm."<sup>69</sup> Police use of ShotSpotter in Chicago "had no significant impact on firearm-related homicides or arrest outcomes."<sup>70</sup>

While gunshot detection technology offers the theoretical benefit of quicker police response times and more efficient law enforcement, the OIG report on its use in Chicago raises starkly whether the tool is justifiable. The very existence of the technology has costs, including "financial resources, the time and attention of CPD members, and the risk that CPD members dispatched as a result of a ShotSpotter alert may respond to an incident with little contextual information about what they will find there."<sup>71</sup> The report did not have any immediate effect. When the Chicago OIG published its findings, the Chicago Police Department had already exercised its option to extend its original \$33 million contract with the company. The new contract is set to expire on August 19, 2023.<sup>72</sup>

Media coverage of the OIG report focused on the unproven efficacy of the technology. The Chicago police had adopted an expensive, "ineffective tool," according to the "scathing report" of the Chicago OIG.<sup>73</sup> The report's findings were similar to a May 2021 analysis

---

<sup>65</sup> OIG Report, *supra* note xx, at 18. A/Os refers to arresting officers.

<sup>66</sup> *Id.* at 3.

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.* at 3.

<sup>70</sup> *Id.* at 6.

<sup>71</sup> *Id.* at 22.

<sup>72</sup> *Id.* at 2.

<sup>73</sup> See, e.g., Julia Marnin, *Chicago's ShotSpotter System Deemed an Ineffective Tool for Gun-Related Crime: Watchdog*, NEWSWEEK, Aug. 24, 2021, at <https://www.newsweek.com/chicagos-shotspotter->

of Chicago's use of ShotSpotter conducted by the MacArthur Justice Center at the Northwestern School of Law.<sup>74</sup> The MacArthur study analyzed a slightly different time period—July 1, 2019 to April 13, 2021—but came to a similar conclusion. In their review of data obtained from Chicago's OEMC, of the 46,743 police responses prompted by a ShotSpotter alert during the review period, the vast majority—85.6%—yielded no evidence of a crime or any other reportable incident by the responding officers.<sup>75</sup> These “dead-end” responses by the police were not evenly distributed across the city.<sup>76</sup> By matching the locations of ShotSpotter alerts with census data, the MacArthur Justice Center found that during its review period, the technology was “deployed in the 12 districts with the highest proportion of Black and Latinx residents and the lowest proportion of White residents.”<sup>77</sup>

ShotSpotter's response to the Chicago OIG report is one it has stated frequently. Its official statement reported that the “OIG report does not negatively reflect on ShotSpotter's accuracy which has been independently audited at 97 percent based on feedback from more than 120 customers.”<sup>78</sup> ShotSpotter claims that its technology can identify gunshots with “97% accuracy,” but the company does not offer evidence from independent studies to support this claim.<sup>79</sup> Nor has the company's proprietary algorithm

---

[system-deemed-ineffective-tool-gun-related-crime-watchdog-1622627](https://www.chicagosuntimes.com/city-hall/2021/8/24/22639473/shotspotter-chicago-police-inspector-general-report-gun-crimes-evidence-shootings); Tom Schuba & Fran Spielman, *City's watchdog finds ShotSpotter rarely leads to evidence of gun crimes, investigatory stops*, CHICAGO SUN TIMES, Aug. 24, 2021, at <https://chicago.suntimes.com/city-hall/2021/8/24/22639473/shotspotter-chicago-police-inspector-general-report-gun-crimes-evidence-shootings> (noting “city's top watchdog issued a scathing report”).

<sup>74</sup> MacArthur Justice Center, Brief of Amici Curiae Chicago Community-Based Organizations Brighton Park Neighborhood Council, Lucy Parsons Labs, and Organized Communities Against Deportation, *State v. Williams* (20-CR-0899601), at <https://www.macarthurjustice.org/wp-content/uploads/2021/05/Motion-for-Leave-to-File-Brief-as-Amici-Curiae-with-Ex.-A-Amicus-Brief-Attached.pdf> [hereinafter “MacArthur Report”].

<sup>75</sup> See MacArthur Report, *supra* note xx, at 10. The Report also found that an even smaller percentage—10.28%—of all ShotSpotter alerts during the period resulted in police reporting an incident about a firearm. *Id.* at 9. According to the report, the “difference between these two figures reflect incidents where police respond to a ShotSpotter alert but end up stumbling upon some reportable incident.” *Id.* at 10.

<sup>76</sup> MacArthur Report, *supra* note xx, at 4 (“In reality, the ShotSpotter system produces an astonishing number of dead-ends: alerts of gunfire that turn up no evidence of gunfire, according to the police's own classification of each incident.”).

<sup>77</sup> MacArthur Report, *supra* note xx, at 13-14.

<sup>78</sup> WGN9, *OIG report, ShotSpotter rarely leads to evidence of gun-related crime, changes police behavior*, Aug. 24, 2021, at <https://wgntv.com/news/chicago-news/oig-report-shotspotter-rarely-leads-to-evidence-of-gun-related-crime-changes-police-behavior/>.

<sup>79</sup> See ShotSpotter, About ShotSpotter, <https://www.shotspotter.com/company/>

ever been peer reviewed by independent researchers.<sup>80</sup> A 2022 investigation by the Associated Press found that the technology can miss gunfire close to its sensors or produce false positives by misclassifying sounds like backfiring cars and fireworks as gunshots.<sup>81</sup>

Even if the technology were accurate, the technology's ability to reduce gun violence is unclear.<sup>82</sup> ShotSpotter itself claims that its product leads to increases in arrests and reductions in violence, but these claims are not based on peer-reviewed studies.<sup>83</sup> By contrast, researchers in 2022 examined ShotSpotter use in 68 large counties from 1999 to 2016 and found that there was no difference in homicides, murder arrests and weapons arrests between those large metropolitan counties that used the technology and those that did not.<sup>84</sup>

Even more troubling are reported cases in which ShotSpotter's own analysts have testified in court that they reclassified sounds as gunshots at the request of their police customers: a practice that the employee said "happens all the time."<sup>85</sup> A reclassified ShotSpotter alert was the key evidence police relied upon to arrest Michael Williams in 2021.<sup>86</sup> Williams

---

<https://perma.cc/HBH7-P378>] (stating "97% Accuracy (aggregate across all customers 2019-2020); see MacArthur Report, *surpa* note xx, at 4 ("The company has never provided validated studies to back up its astonishing claim of '97%' accuracy or 0.5% false positives."); see also VICE (quoting a ShotSpotter employee's court testimony about the accuracy rate as "put together by our sales and marketing department, not our engineers."); *Are gunshot-detecting microphones worth the money?*, THE ECONOMIST, Dec. 4, 2021, at <https://www.economist.com/united-states/2021/12/04/are-gunshot-detecting-microphones-worth-the-money> (observing of ShotSpotter that "there is little independent evidence that it reduces crime overall").

<sup>80</sup> See AP Report, *supra* note xx.

<sup>81</sup> See *id.* Some police departments have ended their use of ShotSpotter because of disappointing results. See, e.g., Kenneth C. Crowe II, *Troy will turn off ShotSpotter*, TIMES UNION, Oct. 30, 2012, at <https://www.timesunion.com/local/article/Troy-will-turn-off-ShotSpotter-3994808.php> (quoting police chief as saying that system was "unreliable" and "expensive").

<sup>82</sup> Mitchell L. Doucette et al., *Impact of ShotSpotter Technology on Firearm Homicides and Arrests Among Large Metropolitan Counties: A Longitudinal Analysis, 1999-2016*, 98 J. URBAN HEALTH 609, 619 (2021), at <https://pubmed.ncbi.nlm.nih.gov/33929640> ("Despite minimal evidence-based peer-reviewed research, ShotSpotter technology has been implemented throughout the USA, with more than 100 cities implementing the technology since it was made commercially available in the mid-2000s.").

<sup>83</sup> ShotSpotter, Results, at <https://www.shotspotter.com/results/>.

<sup>84</sup> Doucette, *supra* note xx, at 616; but see Lorrain Green Mazerolle et al., *A Field Evaluation of the ShotSpotter Gunshot Location System: Final Report on the Redwood City Field Trial* (1999), at <https://www.ojp.gov/ncjrs/virtual-library/abstracts/field-evaluation-shotspotter-gunshot-location-system-final-report> (finding in Justice Department funded study that technology was able to detect nearly 80 percent of test shots).

<sup>85</sup> See AP Report (reporting testimony of ShotSpotter engineer Paul Greene in 2016 New York state case).

<sup>86</sup> *Id.* The following facts are taken from the AP investigation.

told the police that someone in an another car shot at him after he had picked up an acquaintance in the South Side neighborhood of Chicago on May 31. The bullet hit the car's passenger, who died two days later. The state's case against Williams hinged mainly on a ShotSpotter alert identifying a shooting at the intersection where the victim had been shot. Prosecutor's interpreted this alert, along with a surveillance video of Williams running a red light, to mean that Williams had shot the victim himself. Evidence from the pretrial hearing showed that the ShotSpotter algorithm had identified the noise as a firework with 98% confidence.<sup>87</sup> A company employee relabeled the noise as a gunshot. A judge ultimately dismissed the case because of insufficient evidence, but not before Williams spent eleven months in jail.<sup>88</sup>

These findings on the results obtained by police use of ShotSpotter alone are important. They caution not just a skepticism of an expensive policing technology that may not come close to delivering its promises about reducing violence and improving police responses. More broadly, these findings also contribute to a growing body of scholarship and activism that questions the implementation of "tech solutionism" to address complex structural problems of violence, poverty, and disadvantage that no single technological tool can solve.<sup>89</sup>

## B. ShotSpotter's Automation Surprise

---

<sup>87</sup> *Id.* Some people had used fireworks in protests throughout the weekend in Chicago in response to George Floyd's murder. See Todd Feathers, *Police Are Telling ShotSpotter to Alter Evidence from Gunshot-Detecting AI*, MOTHERBOARD, July 26, 2021, at <https://www.vice.com/en/article/qj8xbq/police-are-telling-shotspotter-to-alter-evidence-from-gunshot-detecting-ai/>.

<sup>88</sup> See AP Report, *supra* note xx. ShotSpotter issued a lengthy response to the AP and asserted that "the injustices from this incident will only be perpetuated if lies are permitted to cover up the facts." See ShotSpotter, *ShotSpotter's Response to Associated Press Article*, ShotSpotter, Aug. 26, 2021, at <https://www.shotspotter.com/law-enforcement/shotspotter-response-to-associated-press-article/>.

<sup>89</sup> Evgeny Morozov identifies and critiques the idea of tech solutionism: that social problems can be solved with the development of the right technologies. EVGENY MOROZOV, *TO SAVE EVERYTHING, CLICK HERE: THE FOLLY OF TECHNOLOGICAL SOLUTIONISM* (2014); cf. Doucette, *supra* note xx, at 616 ("Unlike public policies that take time and political will to implement, ShotSpotter is available for purchase, and its implementation is dictated by a municipality's willingness to pay."). The global pandemic has also accelerated some kinds of tech solutionism. See Algorithm Watch, *Automated Decision-Making Systems in the COVID-19 Pandemic: A European Perspective* (2020), at <https://algorithmwatch.org/en/wp-content/uploads/2020/08/ADM-systems-in-the-Covid-19-pandemic-Report-by-AW-BSt-Sept-2020.pdf> (noting pervasiveness of "'technological solutionism,' a flawed ideology that conceives of every social problem as a 'bug' in need of a 'fix' through technology . . . even in the face of scant evidence").



Another observation in the Chicago OIG review of Shotspotter’s technology drew less attention but was equally important. Although the OIG report was able to match ShotSpotter alerts to 1,056 stops conducted by the police because they shared the same event number, they found some unanticipated information. This section describes these findings, buried in the database of police stop reports, and explains their importance in the growing automation of policing.

### 1. Terry stops and Investigative Stop Reports in Chicago

Every Chicago police officer who conducts a “Terry” stop of an individual must complete an investigatory stop report (ISR).<sup>90</sup> This includes details about the person stopped as well as the facts supporting the required legal justification of reasonable suspicion.<sup>91</sup> Officers must also include the relevant ShotSpotter event number when one is associated with the stop.<sup>92</sup> This system permitted the OIG to query the Chicago ISR database to find matching event numbers to the ShotSpotter alerts identified during the review period.<sup>93</sup>

Every police stop in Chicago in theory must produce a recorded narrative about the encounter. The OIG searched the narratives of the ISR database to see if other nonstandard information could be discovered about ShotSpotter use. By searching for the terms “SPOTTER” or “SST,” the OIG found an additional 1,366 ISRs that did not match any of the more than 50,000 ShotSpotter event numbers during the review period. The OIG reviewed a sample of this other set of police stop narratives—72 of the 1,366—for further review.

Some portion of these reports were likely due to recordkeeping issues. Based on their review of these nonstandard references to ShotSpotter, the OIG found that approximately 18 percent of the 72 reports sampled could in fact be traced to an existing ShotSpotter

---

<sup>90</sup> OIG Report, *supra* note xx, at 11.

<sup>91</sup> See Chicago Police Department, Investigatory Stop Report Form, at <https://directives.chicagopolice.org/forms/CPD-11.910.pdf>. In *Terry v. Ohio*, the Supreme Court articulated the standard for brief investigatory detentions. *Terry v. Ohio*, 392 U.S. 1, 31 (1968). The police may temporarily detain a person if there is “reasonable, articulable suspicion that criminal activity is afoot.” *Illinois v. Wardlow*, 528 U.S. 199, 124 (2000). The police officer must have facts that support more than an “inchoate and unparticularized suspicion or ‘hunch.’” 392 U.S. at 30.

<sup>92</sup> OIG report, *supra* note xx, at 11.

<sup>93</sup> See *id.*

alert.<sup>94</sup> These were stops that should have been initially cross-referenced with an existing ShotSpotter alert, but were not, either out of inadvertence or otherwise. But another set of investigatory stop reports sampled by the OIG uncovered an unexpected finding not captured in the quantitative analysis of official ShotSpotter event alerts.

## 2. “Changing Police Behavior”

Among the 72 randomly sampled stop reports that did not match known ShotSpotter alerts but did refer to the technology, the OIG identified ten reports where police officers referred to the “*aggregate results of the ShotSpotter system* as informing their decision to initiate the stop or their course of action during the stop, even when they were not responding to a specific ShotSpotter alert.”<sup>95</sup> In other words, some police officers had justified stops and frisks not because they were responding to a specific alert, but because they were in an area they personally believed to be the site of more than one previous alert.

For example, one investigatory stop report referred not to a specific ShotSpotter alert but more generally to “multiple bonafide ShotSpotter events in the area” where the individual stopped had been observed as part of the basis for the stop (Figure 2).<sup>96</sup>

---

<sup>94</sup> *Id.* at 19. In these reports, the officer creating the ISR recorded the stop under one even

<sup>95</sup> *Id.* at 19 (emphasis in original).

<sup>96</sup> *Id.* (citing “Case 3”).

EVENT#08135 BWC IN USE. R/O'S WERE ON PATROL IN A HIGH CRIME AREA WITH MULTIPLE ONGOING GANG AND NARCOTIC CONFLICTS, SPECIFICALLY AN ONGOING GANG WAR BETWEEN [gang] AND [gang]/ ALSO, MULTIPLE BONAFIDE SHOT SPOTTER EVENTS IN THE AREA. THIS AREA IS PRIORITY ZONE #2 IN THE 007TH DISTRICT. R/O'S TURNED S/B ON [street] FROM [street]. R/O'S OBSERVED WHO THE R/O'S NOW KNOW AS [subject] LOOK IN R/O'S DIRECTION, GRAB HIS WAISTBAND, AND BEGAN TO SKIP TOWARDS THE FRONT DOOR OF THE RESIDENCE [address], BEFORE FULL SPRINTING INTO THE RESIDENCE. [subject] THEN ENTERED SAID RESIDENCE. R/O'S THEN BEGAN TO TOUR THE AREA IN THE WEST ALLEY ON THE [location] AND [subject] (OFFENDER) THEN EMERGED FROM THE GANGWAY AT [address]. R/O [officer] THEN GAVE CHASE AND [subject] (OFFENDER) CONTINUED TO FLEE. R/O [officer] CONTINUED CHASING OFFENDER, AT WHICH TIME [subject] (OFFENDER) JUMPED A FENCE AND A BLACK FIREARM FELL FROM HIS PERSON. [subject] (OFFENDER) THEN PICKED SAID FIREARM BACK UP AND CONTINUED TO RUN. P.O [officer] GAVE A DIRECTION OF FLIGHT VIA OEMC RADIO AND R/O [officer] WAS ABLE TO CUT OFF AND OBSERVE [subject] (OFFENDER) THROW A BLACK FIREARM ONTO THE ROOF AT [address]. R/O [officer] WAS ABLE TO PLACE [subject] (OFFENDER) INTO CUSTODY WITHOUT INCIDENT. R/O'S REQUESTED CFD TRUCK 41 TO RETRIEVE THE FIREARM FROM THE ROOF. FIREARM RECOVERY DOCUMENTED ON BWC. R/O'S RECOVERED 1 LOADED BLUE STEEL MASTERPIECE ARMS MPA DEFENDER 9MM WITH A 4.5 INCH BARRELL YIELDING SERIAL #[number], ATTACHED WAS A BLACK HIGH CAPACITY MAGAZINE WITH MULTIPLE LIVE ROUNDS (INV#[number]). R/O'S THEN TRANSPORTED ARRESTEE TO THE 007TH DISTRICT FOR FURTHER PROCESSING. A SUBSEQUENT NAME CHECK REVEALED THE ARRESTEE DOES NOT POSSESS A CCL<sup>52</sup> NOR FOID. NAME CHECK CLEAR. ARRESTEE IS A SELF-ADMITTED [gang]. NOT A FELON. NO WANTS/WARRANTS/IA'S. GUN DESK NOTIFIED WEAPON IS CLEAR NOT REGISTERED PER [officer].

Figure 2: “multiple bonafide Shot Spotter events in the area”<sup>97</sup>

Other reports also cited “ShotSpotter results in the aggregate” in order to justify frisks of the persons who had been stopped (Figure 3).<sup>98</sup> One officer justified a frisk of an individual in part “due to many Shot Spotter alerts . . . reasonably believed this weight [sic] object to possibly be a firearm.”(Figure 4).<sup>99</sup> Another officer justified an investigatory stop in part because of being “on patrol in an area known for its high volume of Shot Spotter notifications.”<sup>100</sup> Only one of the ten sampled reports in which

---

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

<sup>99</sup> *Id.* at 21-22 (citing “Case 5”).

<sup>100</sup> *Id.* at 21 (citing “Case 4”).

ShotSpotter is referred to in this way—not tied to a particular alert--resulted in an arrest.<sup>101</sup>

ISR #010151171

EVENT # 13516. BWC INCIDENT. R/O'S ON PATROL IN AN AREA KNOWN FOR ITS HIGH VOLUME OF SHOT SPOTTER NOTIFICATIONS AND PERSON WITH A GUN CALL. IN THAT, WHILE ON PATROL R/O'S OBSERVED THE ABOVE STATED VEHICLE PARKED AT THE ABOVE STATED ADDRESS MORE THAN 12 INCHES FROM THE CURB WHICH IS A VIOLATION CODE OF MCC 9-64-020(A). R/O UTILIZED HIS UNMARKED POLICE VEHICLE SPOT LIGHT AND SHINNED [sic] IT TOWARDS THE WINDSHIELD OF THE ABOVE STATED VEHICLE. IT WAS AT THIS TIME, R/O OBSERVED A M/1 NKA ABOVE SUBJECT SEATED IN THE FRONT PASSENGER SEAT. R/O THAN NOTICED THE ABOVE SUBJECT REACH TOWARDS THE CENTER OF HIS WAIST LINE AND BEGAN TO ADJUST THE TOP PART OF HIS PANTS. IN ADDITION, R/O THEN OBSERVED THE ABOVE SUBJECT BEND HIS UPPER BODY FORWARD CAUSING BOTH OF HIS ARMS TO BE NON VISIBLE. R/O EXITED HIS POLICE VEHICLE AND APPROACHED THE PARKED VEHICLE FROM THE PASSENGER SIDE AND BEGAN TO COMMUNICATE WITH THE ABOVE SUBJECT. R/O REQUESTED FROM THE ABOVE SUBJECT TO PROVIDE PROOF OF IDENTIFICATION AT WHICH TIME HE FAILED TO PROVIDE ONE. WHILE COMMUNICATION WITH THE ABOVE SUBJECT, R/O SMELLED AN ODOR OF ALCOHOLIC BEVERAGE EMITTING FROM THE VEHICLE AND NOTICED THE ABOVE SUBJECTS HANDS TO TREMBLE. BASED ON R/O'S EXPERIENCE IN NUMEROUS WEAPONS VIOLATION ARRESTS, R/O REASONABLY BELIEVED THE ABOVE SUBJECT WAS IN POSSESSION OF A FIREARM. R/O REQUESTED THE ABOVE SUBJECT TO EXIT THE VEHICLE FOR FURTHER INVESTIGATION. UPON DOING SO, R/O PERFORMED A PROTECTIVE PAT DOWN BASED ON THE KNOWN VIOLENT AREA AND ABOVE SUBJECTS SUSPICIOUS BEHAVIOR [ADJUSTING WAIST LINE, BENDING UPPER BODY FORWARD, AND TREMBLING HANDS]. NEGATIVE RESULTS OF ANY WEAPONS. THE ABOVE SUBJECT THEN RELATED TO R/O THAT THERE WAS A BOTTLE OF ALCOHOL IN THE VEHICLE AND THAT HE HAD BEEN DRINKING. R/O'S PERFORMED A SEARCH OF THE VEHICLE FOR THE POSSIBILITY OF ANY OPEN CONTAINERS OF ALCOHOL IN THE VEHICLE. R/O'S DISCOVERED A BOTTLE OF COURVOISIER ALCOHOLIC BEVERAGE WITH A BROKEN SEAL LOCATED ON THE FLOOR BOARD IN FRONT OF THE REAR PASSENGER SEAT. NAME CHECK OF ABOVE SUBJECT CLEAR. ABOVE SUBJECT WAS GIVEN A VERBAL WARNING AND WAS RELEASED WITHOUT INCIDENT. ABOVE SUBJECT REFUSED AN ISR RECEIPT.

Figure 3: “In an area known for its high volume of Shot Spotter Notifications”<sup>102</sup>

---

<sup>101</sup> *Id.*

<sup>102</sup> *Id.* at 21.

EVENT 02301. BWC ACTIVE. IN SUMMARY, R/OS WERE ON ROUTINE PATROL DRIVING NORTHBOUND ON [street] APPROACHING [street] WHEN R/OS SAW LISTED SUBJECT CROSSING STREET WALKING SOUTHBOUND ON [street]. AT THIS TIME, LISTED SUBJECT GAVE THE MIDDLE FINGER TO R/OS AND YELLING OBSCENITIES AT R/OS. R/OS THEN NOTICED A LARGE WEIGHTED OBJECT IN HIS FRONT HOODIE POCKET. DUE TO MANY SHOT SPOTTER ALERTS AND GANG ACTIVITY IN THE PROXIMITY TO THIS LOCATION, R/OS REASONABLY BELIEVED THIS WEIGHT OBJECT TO POSSIBLY BE A FIREARM. R/OS THEN CONDUCTED A STREET STOP AT THE LISTED LOCATION. R/OS THEN CONDUCTED A PAT DOWN WITH

NEGATIVE FINDINGS OF WEAPONS. SUBJECT [sic] HAD A BAG AROUND HIS SHOULDER, AND R/OS ASKED IF THEY COULD LOOK INSIDE TO WHICH SUBJECT GAVE PERMISSION. R/OS SEARCHED THE BAG AND FOUND A SMALL SEALED, ODORLESS, CHILDPROOF CONTAINER WITH SUSPECT CANABIS INSIDE IT. SUBJECT GAVE R/OS HIS IL ID CARD AND R/OS RAN NAME THROUGH [sic] LEADS AND CLEAR,<sup>53</sup> WITH A FINDING OF NO WANTS OR WARRANTS AT THIS TIME. THROUGHOUT THIS EVENT, SUBJECT WAS VERY VERBALLY AGGRESSIVE BY CONTINUOUSLY YELLING AT R/OS AND CALLING R/OS OBSCENITIES. SUBJECT REFUSED AN ISR RECEIPT AND THE STOP WAS CONCLUDED WITHOUT INCIDENT.

Figure 4: “Due to many Shot Spotter alerts”

The quantitative analysis would have missed these surprising results, and alone would have underrepresented “the extent to which the introduction of ShotSpotter technology in Chicago has changed the way CPD members perceive and interact with individuals present in areas where ShotSpotter alerts are frequent.”<sup>103</sup> Although the OIG reviewed only 72 of the 1,366 reports that referred to ShotSpotter but were not associated with a specific alert, it concluded that “some officers, at least some of the time, are relying on ShotSpotter results in the aggregate to provide an additional rationale to initiate stop or to conduct a pat down once a stop has been initiated.”<sup>104</sup>

According to the company’s own materials, ShotSpotter is not meant to be used this way. As one of the company’s own promotional videos explains, if a gun is fired in an area where sensors are located, the information for a *particular suspected gunshot* is sent to the company for analysis. The identification of a probable gunshot is then routed to the police who can be dispatched to the scene “to engage the shooter, interview witnesses,

<sup>103</sup> *Id.* at 19.

<sup>104</sup> *Id.*

and collect key evidence at the crime scene.”<sup>105</sup> In other words, ShotSpotter’s intended uses are for the identification of specific identified gunshots in order to help police with more rapid and efficient responses, and not . . . .

### C. Why automation surprises matter in policing

We should not dismiss this subset of stop reports as instances where a technological tool has been misused or misunderstood by the police. These surprising uses of ShotSpotter show us how automation changes policing itself in unexpected ways, rather than simply provides the police with an additional tool. The technology changed the way some police officers “perceive and interact with individuals present in areas where ShotSpotter alerts are frequent.”<sup>106</sup> Broad assumptions that certain places were associated with gunshot detection alerts were “substantively changing police behavior” in Chicago.<sup>107</sup> These were not police responses to specific incidents of probable gunshots. Automation changed police behavior through its very existence.<sup>108</sup>

Assuming that ShotSpotter would simply swap out human eyes and ears for machines provides us with an example of the “substitution myth.” In reality, the introduction of automation can “transform practice[s].”<sup>109</sup> To be sure, the technology often did work as intended: alerts led to police responses to places where probable gunshots had been detected—tens of thousands of times. But it also happened that the mere awareness that certain neighborhoods *at some unspecified times in the past* been associated with a high but *unspecified number* of alerts became a cognitive shortcut for an indicator of suspiciousness. No official directive told officers whether a certain number of alerts over a specific period of time in a place could help justify characterizing a person found there

---

<sup>105</sup> Shot Spotter, How ShotSpotter Gunshot Detection Works (updated Aug 2021), YouTube, Aug. 24, 2021, at <https://www.youtube.com/watch?v=Nk98otdlzFI>.

<sup>106</sup> OIG Report, *supra* note 3.

<sup>107</sup> *Id.* at 22.

<sup>108</sup> See NetGain Partnership, *supra* note xx, at 19 (“[A]utomation and quantification change the things they touch.”).

<sup>109</sup> Sarter, *supra* note xx, at 21.

as suspicious. Yet these generalized references to the technology's alerts became a "fact" to help justify a stop or frisk.<sup>110</sup>

Recall that OIG's conclusion based on its quantitative analysis of more than 50,000 alerts. Chicago's protocols, which send a police response to every ShotSpotter alert, "rarely produce evidence of a gun-related crime, rarely give rise to investigatory stops, and even less frequently lead to the recovery of gun crime-related evidence during an investigatory stop."<sup>111</sup> In other words, the total number of ShotSpotter alerts yielded very few investigative successes for the police.

Individual officers did not, of course, make these calculations when they referred to a place as a site of multiple prior alerts. Instead, they made their own quick judgments that certain areas were subject to multiple alerts, and therefore would help justify a Terry stop of a person, a frisk for weapons on that person, or both. This was an unexpected consequence of introducing this particular form of automation into police work: one that both changed police officer's perceptions and behavior in the neighborhoods they patrolled and the people they encountered.<sup>112</sup>

Identifying such effects matters for several reasons. First, the ShotSpotter example suggests how human discretion can creep into automated decisionmaking. Inferring that a large number of alerts means that a place is dangerous and thus people found within it could pose dangers to the police is not an intended use of the technology. Both ShotSpotter and the Chicago Police Department presume police responses that are premised on specific alerts. Yet as the OIG Report uncovered, officers in Chicago used what they assumed about ShotSpotter alerts in the aggregate to justify stops and frisks. Under some conditions, such assumptions might be justified. One can imagine a block or a set of blocks where multiple alerts did yield evidence of gun violence on repeated occasions. But the surprising reports identified by the Chicago OIG did not reference any particular number of alerts in any particular time frame. "Many ShotSpotter alerts"

---

<sup>110</sup> Sarter, *supra* note xx, at 2 (noting that surprises can occur when automation is based upon "designers assumptions about intended rather than actual use of automation").

<sup>111</sup> OIG Report, *supra* note xx, at 22.

<sup>112</sup> *Id.* at 3 (concluding that the "introduction of ShotSpotter technology in Chicago has changed the way some CPD members perceive and interact with individuals present in areas where ShotSpotter alerts are frequent").

became a shorthand for an officer believing that an area is generally dangerous whether or not it actually is.

Perhaps such intuitions are no different than a sense that a neighborhood is a “high crime area.” And courts do permit the police to rely on such determinations as part of the justification for a stop. After all, the Supreme Court has permitted such a broad statement to be part of the reasonable suspicion calculus, and in a case arising in Chicago, no less.<sup>113</sup> But if the two justifications are similar, then we can level the same critiques at them. That a place is a “high crime area” is “hardly ever empirically supported with factual evidentiary proof,” yet is accepted repeatedly by courts as a valid factor for reasonable suspicion.<sup>114</sup> And as legal scholars have pointed out, the “high crime” designation often results in discriminatory policing in low income, communities of color.<sup>115</sup>

The concern raised by the use of ShotSpotter in Chicago, however, is that that how and whether to use these generalized references to multiple alerts is left entirely up to individual officers. Individual officer decisions about whether or not a neighborhood is site of multiple aggregate alerts are only vaguely “data-driven,” at best. And those discretionary choices can increase the potential for violence at the hands of the police. Just as every actual ShotSpotter alert sends a police response to an area where there may be a potentially armed individual, the perception that an area associated with multiple alerts can influence police decisionmaking on the scene about potential threats and whether to resort to force.<sup>116</sup>

Second, the way that ShotSpotter unexpectedly altered police behavior has ramifications elsewhere. ShotSpotter itself claims that at least 120 cities around the country have

---

<sup>113</sup> *Illinois v. Wardlow*, 528 U.S. 119 (2000) (“[W]e have previously noted the fact that the stop occurred in a ‘high crime area’ among the relevant contextual considerations in a *Terry* analysis”)(citing *Adams v. Williams*, 407 U.S. 143, 144, 147-148 (1972)).

<sup>114</sup> Andrew G. Ferguson & Damien Bernache, *The “High Crime Area” Question: Requiring Verifiable and Quantifiable Evidence for Fourth Amendment Reasonable Suspicion Analysis*, 57 AM. UNIV. L. REV. 1587, 1591 (2008).

<sup>115</sup> See, e.g., David A. Harris, *Factors for Reasonable Suspicion: When Black and Poor Means Stopped and Frisked*, 69 IND. L. J. 659, 677-78 (1994) (“African Americans and Hispanics make up almost all of the population in most of the neighborhoods the police regard as high crime areas.”).

<sup>116</sup> Cf. *Commonwealth v. Ford*, No. 20-P-1334 (Appeals Ct. Mass Feb. 18, 2022)(noting that officer responding to ShotSpotter alert approached defendant and “unholstered his firearm but kept it in the ‘low, ready position,’ pointed at the ground). At 4.



contracted for its services.<sup>117</sup> If the behavior of Chicago police officers has been changed by the use of ShotSpotter, we should expect similar behavior in the other cities where the technology is being used. We can also apply the insights from Chicago to other police technologies besides acoustic gunshot detection. Consider predictive policing software, which analyzes historical crime data and other factors to predict which locations are more likely to be sites of criminal offending in the future.<sup>118</sup> Like ShotSpotter, predictive policing programs are designed to direct specific responses to individual forecasts about crime and place. Just as in Chicago, however, individual police officers in a department using predictive policing might rely not just on specific alerts but also decide to rely on generalized assessments that certain neighborhoods, blocks, or places are sites of previous predictions in the aggregate. A reference to “multiple predictive alerts” associated with a place may become part of the justification an officer uses for an investigative detention or frisk of a person encountered there. That same approach might also be applied to future applications, like ongoing live facial recognition that looks for wanted persons. All of these represent unexpected consequences of police use of technology that leads to highly discretionary decisionmaking.

Moreover, these discretionary uses are at odds with the rhetoric of these technologies: assertions about precision techniques that represent the cutting edge of artificial intelligence in policing.<sup>119</sup> The Deputy Director of the Chicago Police Department responded to the OIG report’s findings by emphasizing the “real-time alerts of detected gunfire enabling patrol officers to arrive at a precise location of a shooting event quickly.”<sup>120</sup> Police reliance on a generalized assertion that a place has been subject to

---

<sup>117</sup> ShotSpotter, About ShotSpotter, at <https://www.shotspotter.com/company/>.

<sup>118</sup> For a detailed description of predictive policing, see Andrew Ferguson, *Predictive Policing and Reasonable Suspicion*, 62 Emory L. J. 259, 265-285 (2012).

<sup>119</sup> Cf. Tom Schuba & Fran Spielman, *City’s watchdog finds ShotSpotter rarely leads to evidence of gun crimes, investigatory stops*, CHICAGO SUN-TIMES, Aug. 24, 2021, at <https://chicago.suntimes.com/city-hall/2021/8/24/22639473/shotspotter-chicago-police-inspector-general-report-gun-crimes-evidence-shootings> (quoting Chicago City Council Committee on Public Safety Chairman as saying CPD cannot afford to be “left behind” when other big city departments “are moving toward more technology-based policing”); cf. *State v. Gayle*, 2017 WL 1034442, at \*1 (Sup. Ct. N.J., App. Div.) (quoting police explanation of ShotSpotter as a system “used for snipers in Iraq to pinpoint a sniper. We use it now in the city to pinpoint firearms.”).

<sup>120</sup> WGN9. *OIG report, ShotSpotter rarely leads to evidence of gun-related crime, changes police behavior*, Aug. 24, 2021, at <https://wgntv.com/news/chicago-news/oig-report-shotspotter-rarely-leads-to-evidence-of-gun-related-crime-changes-police-behavior/>.

multiple ShotSpotter alerts in the past may be not so different than calling it a “high crime neighborhood.” Yet there is a difference. Police chiefs describe ShotSpotter as a technological “game-changer.”<sup>121</sup> In reality, it can obscure what looks like the use of very human, discretionary (and flawed) decisionmaking.<sup>122</sup>

And if police are incorporating automated decisionmaking into their own ordinary discretionary choices, then we can apply familiar tools of analysis. American police have always possessed a great deal of discretionary power.<sup>123</sup> How to exercise that authority, and what restraints should be imposed upon that power has captured the attention of judges, legislators, and scholars for more than sixty years.<sup>124</sup> Why does it matter to identify and understand this unexpected use of automation in policing as one of police discretion? It matters because such uses can be readily understood and addressed. They are neither novel nor require highly technical knowledge. These are ordinary and persistent problems in policing.<sup>125</sup>

Third, traditional Fourth Amendment law is unlikely to say much about tools like ShotSpotter even as it appears to change police perceptions and behavior. The required Fourth Amendment standard for stops and frisks is reasonable suspicion, which the Supreme Court has explained involves “commonsense, nontechnical conceptions that deal with ‘the factual and practical considerations of everyday life on which reasonable and prudent men, not legal technicians, act.’”<sup>126</sup> Legal scholars have widely criticized the

---

<sup>121</sup> AP Report, *supra* note xx (“Police chiefs call ShotSpotter a game-changer.”).

<sup>122</sup> See Brayne, *supra* note xx, at 6 (observing that “although part of the appeal of big data lies in its promise of less discretionary and more objective decision-making, new analytic platforms and techniques are deployed in preexisting organizational contexts”).

<sup>123</sup> Alice Ristroph, *What is Remembered*, 118 MICH. L. REV., 1157, 1168 (2020).

<sup>124</sup> The “discovery” of police discretion is usually attributed to the pioneering study of the American Bar Foundation in the 1950s, which turned conventional thinking about the police “on its head.” See George Kelling (National Institute of Justice), “Broken Windows” and Police Discretion 21-23 (1999), at <https://www.ojp.gov/pdffiles1/nij/178259.pdf>. That discovery spawned a robust body of research by sociologists, criminologists, and legal academics. See, e.g., Kenneth Culp Davis, *An Approach to Legal Control of the Police*, 52 TEX. L. REV. 703, 706 (1974) (“Police discretion is absolutely essential. It cannot be eliminated. Any effort to eliminate would be ridiculous. But *unnecessary* police discretion can and should be eliminated, and necessary discretion can and should be controlled—can and should be properly confined, structured, and checked.”).

<sup>125</sup> See, e.g., Joseph Goldstein, *Police Discretion Not to Invoke the Criminal Process: Low-Visibility Decision in the Administration of Justice*, 69 YALE L. J. 543, 543 (1960)(observing that police discretion “not to invoke the criminal process” . . . are generally of extremely low visibility” and yet review of them “is essential to the functioning of the rule of law in our system of criminal justice”).

<sup>126</sup> *Ornelas v. United States*, 517 U.S. 690, 695 (1996) (quoting *Illinois v. Gates*, 462 U.S. at 231).

standard as so vague as to be virtually meaningless, and thus permitting nearly wholly discretionary stops, particularly against communities of color.<sup>127</sup> Indeed, the Court's own analysis in *Terry* acknowledges the limited ability of courts to rein in police conduct in encounters on the street.<sup>128</sup>

Courts have begun to decide cases involving ShotSpotter alerts, and the emerging picture suggests that even a single alert can be part of the reasonable suspicion calculus.<sup>129</sup> In a 2020 decision, the Seventh Circuit concluded that ShotSpotter was “analogous to an anonymous tipster” and that two alerts, along with other factors, were sufficient to provide reasonable suspicion for a stop.<sup>130</sup> In 2022, a Massachusetts appeals court held that the stop and frisk of the defendant was supported by reasonable suspicion, based in part on a ShotSpotter alert.<sup>131</sup> The court noted that police reliance on ShotSpotter did not depend on the technology's “reliability as an indicator of ‘actual’ gunshots, but merely an indicator of ‘potential’ gunshots, i.e. noises that could be gunshots.”<sup>132</sup> Instead, the alerts akin to an “acoustic trail of breadcrumbs,” permitting the inference that the individual the officer encountered might be connected to the possible gunshot detected.<sup>133</sup>

Technological tools like ShotSpotter are unlikely to alter how courts view the Fourth Amendment. Like acoustic gunshot detector technology, predictive policing forecasts pose a novel problem for Fourth Amendment analysis. Andrew Ferguson has explained that a predictive policing forecast will likely be considered a legitimate factor supporting

---

<sup>127</sup> See, e.g., David A. Harris, *Particularized Suspicion, Categorical Judgements: Supreme Court Rhetoric Versus Lower Court Reality Under Terry v. Ohio*, 72 ST. JOHN'S L. REV. 975, 1022 (1998) (observing that Terry stops have permitted police targeting of racial minorities); Christopher Slobogin, *Let's Not Bury Terry: A Call for Rejuvenation of the Proportionality Principle*, 72 St. John's L. Rev. 1053, 1054-55 (1998) (observing that Terry v. Ohio's standard “is a mess”).

<sup>128</sup> See, e.g. Debra Livingston, *Police Patrol, Judicial Integrity, and the Limits of Judicial Control*, 73 St. John's L. Rev. 1353, 1359 (1988) (“The [Terry] Court recognized that police engage in abusive conduct in street encounters for purposes wholly unrelated to any legitimate interest in investigating crime or keeping the peace . . . and admitted that its decision was unlikely to stop such behavior.”).

<sup>129</sup> See, e.g., *People v. Pope*, 194 A.D. 449 (N.Y. 2021) (finding existence of reasonable suspicion based in part on “ShotSpotter report[ing] that numerous shots had been fired at a particular location”).

<sup>130</sup> *U.S. v. Rickmon*, 952 F.3d 876, 882, 885 (7th Cir. 2020). The appeals court did note in dicta that “we question whether a single ShotSpotter alert would amount to reasonable suspicion.” *Id.* at 881; see also *United States v. Jones*, 1 F.3d 50m 53 (D.C. Cir. 2021) (finding reasonable suspicion for *Terry* stop did exist based in part on ShotSpotter alert where police encountered defendant).

<sup>131</sup> *Commonwealth v. Ford*, \_\_\_ N.E. 3d \_\_\_, 2022 WL 497325 (Ct. Appeals Mass.).

<sup>132</sup> *Id.* at \*3, n. 8.

<sup>133</sup> *Id.* at \*4.

an investigative stop.<sup>134</sup> Courts will likely view similarly a single alert, multiple alerts, and perhaps even nonspecific references to multiple prior alerts as contributing to a totality of the circumstances supporting reasonable suspicion. The acceptance of these new types of information may tell us more about the “malleability” of reasonable suspicion than anything else.<sup>135</sup>

Finally, Chicago’s experience with acoustic gunshot detection technology suggests that these tools may yield few benefits in crime prevention or investigation while also resulting in the continued patterns of discriminatory policing. To summarize: the evidence from Chicago suggests that the vast majority of alerts yield no evidence of crime-related to guns other otherwise--yet also send to majority Black and Hispanic neighborhoods police officers who believe they may be encountering someone armed with a gun, sometimes dozens of times a day.<sup>136</sup> Although police response by a technological alert may be novel, residents in these neighborhoods may experience familiar patterns of policing: officers who are deployed to the same neighborhoods multiple times a day expecting volatile situations. With ShotSpotter alerts, responding officers have a “system telling [them] that anybody in the area is a mortal threat.”<sup>137</sup> These deployments can lead to more stops, frisks, tense encounters, and the potential for mistaken perceptions on the part of police or civilians that can lead to unnecessary violence. Relying on generalized yet nonspecific views on previous alerts provide police with more latitude to justify these decisions. This increase in the amount and degree of tense and potentially deadly interactions with the police can exacerbate community alienation from the police.<sup>138</sup>

What results are increased possibilities for stops and frisks for those who already are subjected to intensive policing practices in the city of Chicago. A 2015 study reported that

---

<sup>134</sup> Andrew Ferguson, *Predictive Policing and Reasonable Suspicion*, 62 EMORY L. J. 259, 312 (2012) (“While never enough alone, with some relevant corroboration, a predictive tip will serve as the basis of a constitutional stop. . . . [T]he weight of predictive policing in the totality has the potential to be significant.”).

<sup>135</sup> *Id.*

<sup>136</sup> *Cf.* MacArthur Report, at 2 (“On an average day in Chicago, the ShotSpotter system sends police out on more than sixty dead-end searches for gunfire.”).

<sup>137</sup> *See* Feathers, *Police Are Telling ShotSpotter*, *supra* note xx.

<sup>138</sup> Monica C. Bell, *Police Reform and the Dismantling of Legal Estrangement*, 126 YALE L. J. 2055, 2107-2108 (2017) (“Legal estrangement, emerging out of personal and vicarious experiences, serves as a lens through which many African Americans interpret past and future engagements with law enforcement officials.”).

during 2014, residents of Chicago were subjected to police stops more than four times as often as New Yorkers at the height of that city’s controversial stop and frisk policies from 2002 to 2013.<sup>139</sup> A review of police stops in Chicago conducted over a four month period revealed that 72 % of the stops were of Black residents, who account for just 32 % of the city’s population.<sup>140</sup> When understood against the findings of both the Chicago Office of Inspector General and the MacArthur Justice Center, these increased risks exist without clear public benefits.

In Chicago, these risks have a special significance. The Justice Department’s 2015 investigation of the Chicago Police Department found the city’s predominantly Black and Hispanic neighborhoods “experience policing in a fundamentally different way than do white individuals and white communities.”<sup>141</sup> Residents of majority Black and Hispanic neighborhoods felt that their communities were simultaneously overpoliced and underpoliced. Tactics like “jump-outs”—where police randomly paused their patrol cars and opened their doors to see if residents would run--and repeated stops, interviews, and searches of young people made some communities members feel like they lived in “an open-air prison” guarded by “an occupying force.”<sup>142</sup> At the same time, victims of crime in these same neighborhoods expressed views that the police were unsympathetic to their concerns and took few concrete steps to solve homicides.<sup>143</sup> In 2019, a federal judge approved a consent decree for policing reforms after the state’s attorney general sued for reforms based on the Justice Department’s report.<sup>144</sup> In 2021, the independent monitor

---

<sup>139</sup> ACLU of Illinois, Stop and Frisk in Chicago 3 (March 2015), at [https://www.aclu-il.org/sites/default/files/wp-content/uploads/2015/03/ACLU\\_StopandFrisk\\_6.pdf](https://www.aclu-il.org/sites/default/files/wp-content/uploads/2015/03/ACLU_StopandFrisk_6.pdf). The ACLU Report led to a 2015 settlement with the city that required increased data collection and reporting by the Chicago Police. See Investigatory Stop and Protective Pat Down Settlement Agreement (2015), at <https://www.aclu-il.org/sites/default/files/wp-content/uploads/2015/08/2015-08-06-Investigatory-Stop-and-Protective-Pat-Down-Settlement-Agreeme....pdf>. The high number of stops conducted by the NYPD was ended after Mayor Bill de Blasio agree to reforms ordered by Judge Shira Scheindlin in *Floyd v. City of New York*, 959 F. Supp. 2d 540, 558 (S.D.N.Y. 2013). See Benjamin Weiser & Joseph Goldstein, Mayor Says New York City Will Settle Suits on Stop-and-Frisk Tactics, N.Y. Times, Jan. 30, 2014, at <https://www.nytimes.com/2014/01/31/nyregion/de-blasio-stop-and-frisk.html>.

<sup>140</sup> ACLU of Illinois, *supra* note xx, at 8.

<sup>141</sup> U.S. DEP’T OF JUSTICE, INVESTIGATION OF THE CHICAGO POLICE DEPARTMENT 139 (2017), at <http://chicagopoliceconsentdecree.org/wp-content/uploads/2018/01/DOJ-INVESTIGATION-OF-CHICAGO-POLICE-DEPT-REPORT.pdf>.

<sup>142</sup> *Id.* at 143.

<sup>143</sup> *Id.* at 140, 42.

<sup>144</sup> Consent Decree Documents, Resources, at <http://chicagopoliceconsentdecree.org/resources/>.

of the consent decree found that the Chicago Police had failed to comply with 120 of 315 requirements, and had failed to meet 26 out of 43 agreed-upon deadlines.<sup>145</sup>

## Conclusion

The increasing use of artificial intelligence in policing has understandable appeal to the police: the promise of high-tech solutions to address criminal investigation faster and more efficiently. Yet technology may fail to deliver on these promises and may introduce new, unanticipated complications. In policing, that means the tools of automation will not just substitute for human tasks, or simply perform those tasks more quickly. Evidence from the use of acoustic gunshot detection technology in Chicago provides one such extended example. The major finding of the Office of Inspector General was significant. The technology “rarely” produced evidence of the gun violence it was designed to detect. There was a surprising result as well. Police used the tool not just as intended, but began to rely on a more generalized references to past alerts. This raises a longstanding problem of police discretion that should not be obscured by the arrival of a new technology. It also raises a new question about automation’s surprises that we should identify across the spectrum of new police technologies.

---

<sup>145</sup> See CPD Monitoring Team, Independent Monitor Files Third Report Assessing the Chicago Police Department’s Reform Efforts (Mar. 31, 2021), at [https://cpdmonitoringteam.com/wp-content/uploads/2021/03/2021\\_03\\_31-News-Release-Independent-Monitoring-Report-3.pdf](https://cpdmonitoringteam.com/wp-content/uploads/2021/03/2021_03_31-News-Release-Independent-Monitoring-Report-3.pdf); CPD Monitoring Team, Independent Monitoring Report 3 (Apr. 4, 2021), at <https://cpdmonitoringteam.com/overview/reports-and-resources/third-semi-annual-independent-monitoring-report/>; Frank Main & Fran Spielman, *City blew 40% of police consent-decree deadlines last year; Lightfoot points to ‘substantial progress*, CHI. SUN-TIMES, Mar. 31, 2021, at <https://chicago.suntimes.com/2021/3/31/22360397/chicago-police-department-missed-40-percent-consent-decree-deadlines-lightfoot-substantial-progress>.